FCC Cell Phone Radiation Body SAR Tests Released

"Radiation Exposure Limits Were Exceeded"

The Environmental Health Trust (EHT), a scientific non profit is releasing FOIA documents revealing that the Federal Communications Commission (FCC) had tested several Apple, Samsung, Blu and Motorola smartphone models for radiation exposure levels when the phones were tested in positions mimicking the cell phone in the pocket (at 2mm from the body) and found most of the phone models they tested in the pocket (2 mm) position exceeded the FCCs cell phone radiation SAR limits. However, the FCC labeled the cell phone radiation findings as "confidential" and did not publicly share the results, even in numerous court proceedings that centered on the issue of radiation exposure to people when a phone is in the pocket or very close to the body. The FCC also withheld several documents and EHT filed an appeal to get the withheld records.

The FCC's 2019 cell phone in the pocket radiation tests were conducted in response to an August 21, 2019, *Chicago Tribune* investigation that reported phones tested in close body contact (2 mm) exceeded FCC's radiation limits several-fold. After the Chicago Tribune report was published, the FCC then tested the same cell phone models, the Tribune had tested in two positions:

1. As if the cell phone were in the pocket position (2 mm)
2. With the larger distance of 5, 10 or 15 mm, chosen by the cell phone company for premarket compliance.

The FCCs own tests found the 2 mm tests (as if phone were in tight pants pocket) violated FCC limits whereas the FCC tests *using larger distances (5 to 15mm) were compliant.* The FCC then issued a December 19, 2019 report concluding that the FCC's cell phone tests complied with all U.S. government regulations. However, the report only shared the 5 to 15 mm test data, but omitted the FCC's findings of cell phone SAR radiation levels that exceeded the limit, when tested in 2 mm pocket conditions.

The Chicago Tribune was sent the FCC's report (that did not have all the FCC's findings) and the paper then ran a follow up article on December 20, 2019 stating that the FCC found "no evidence of violations of any FCC rules" for the safety limit."

The Tribune story ended by stating "the FCC's recent study did not test phones at 2 mm distance" even though the FCC, had in fact tested phones at 2mm distance. The FCC did not (as far as EHT is aware) contact the Chicago Tribune to correct this statement nor to send the 2mm test findings.

However, the FCC's letter to Theodora Scarato, Executive Director of Environmental Health Trust states: "We observed that at a 2 mm separation distance, the FCC radiofrequency (RF)

exposure limits were exceeded". The FCC cell phone test results found cell phone radiation SAR levels as high as 5.2 W/kg -violating the FCC's limit of 1.6 W/kg **by over 3 times.**

The FCC argues in its letter to Scarato that, "...we release our 2 mm separation distance test results with the caveat that the 2 mm separation distance test results are inconsistent with FCC practice, and are misleading because they reflect extreme conditions" and that "the RF exposure limit includes a significant safety margin, none of the results suggest there is any RF safety issue…" Scarato of Environmental Health Trust counters that "no safety margin for long term exposure exists, because FCC human exposure limits only protect against short term effects," She pointed to published studies that state FCC limits should be strengthened by over 200 times to protect children.

Further, the FCC tests were carried out when the agency had an active rule-making and court challenge related to the issue of whether cell phones should be tested in body contact positions. Yet the FCC did not share the SAR results in these proceedings.

Current FCC cell phone radiation regulations are unchanged since 1996 and they allow cell phone manufacturers to test their phones for RF emissions with a separation distance *they choose,* generally with a 5 to 25 mm distance between the phone and body. Cell phones are not premarket tested in body contact positions nor in cell phone in the pocket conditions. This is why all cell phones have little known fine print warnings instructing users to keep their body a distance from the phone.

EHT along with numerous expert groups such as the American Academy of Pediatrics have requested an update to the regulations to account for the way people use phones today, in close contact with the body.

The FCC did not include their 2 mm tests in their ongoing proceedings-the FCC's Inquiry on RF human exposure RF limits- that specifically requested comment on the FCC's SAR test procedures that allow manufacturer to use a separation distance. The inquiry states *"Specifically, we seek comment on the feasibility of evaluating portable RF sources without a separation distance when worn on the body to ensure compliance with our limits under present-day usage conditions."*

Instead, the FCC omitted the 2mm SAR test data and stated in their December 4, 2019 *Human RF Exposure* rulemaking that they were opposed to manufacturers premarket testing phones in body contact positions stating "Even though some parties claim that the RF exposure evaluation procedures for phones should require testing with a "zero" spacing – against the body – this is unnecessary." The FCC withheld the test data from this proceeding as well as the subsequent federal case, *Environmental Health Trust et al v. Federal Communications Commission*, United States Court of Appeals for the District of Columbia, Case Nos. 20-1025 (Lead); 20-1138 (Consolidated) (now on Remand) despite the fact that the issue of the cellphone test separation distance was central to the case.

The FCC also did not include the 2 mm cell phone radiation test findings in their court filings in the Apple v. Cohen case in which plaintiffs alleged that cell phones emitted excessive radiation. The FCC further omitted the 2mm test results in its filings for the Berkeley v. the CTIA case in which the Wireless industry CTIA sued the city of Berkeley for its Cell Phone Right to Know ordinance which informed people that phones could exceed limits if not used with the separation distance.

The FCC cell phone radiation test results were not revealed until September 29, 2023 when the findings labeled "Confidential" were released to EHT under the Freedom of Information Act. EHT has now filed an appeal to the FCC as 7 records were withheld from the FOIA.

"If there is a balance to be weighed between protecting deliberative privilege and the notification of the public of harmful interference the balance should be on side of transparency and public health…If phones are exceeding the regulatory limit in positions of real-world use, the public has a right to be informed."

Theodora Scarato stated, " Why did the FCC perform these tests and then decide to withhold the results from the public? Why did the FCC refuse to release all the records? How high beyond the legal limit does the cell phone radiation need to be for the FCC to take enforcement action? It is outrageous that the US allows phones to be tested with whatever separation distance the company wants. Phones should be tested the way they are used! Children and adults use and carry phones pressed to their body for hours every day. We need a strong oversight and compliance program, including post market RF emission and health effect surveillance. It is time for a new approach to cell phone testing, one that reflects the way people use phones today."

The FOIA Appeal and entire FCC FOIA response is available on EHT's website here.

About Environmental Health Trust

Environmental Health Trust is a 501(c)3 nonprofit scientific think tank that promotes a healthier environment through research, education and policy. EHT conducts cutting edge research on environmental health hazards and works with communities, health, education professionals and policymakers to understand and mitigate these hazards.

The Environmental Health Trust had a favorable U.S. Court of Appeals judgment in their case against the FCC. EHT scientists testified in 2009 Senate hearings and 2008 congressional hearing on cell phone radiation- the last ever held. EHT scientists have continued to publish studies on the health effects of non -ionizing electromagnetic radiation and organized numerous national and international scientific conferences on the issue. EHT's scientific publications have been submitted to the FCC record as critical evidence. Visit www.ehtrust.org for more information.

Do Cell Phone Companies Tell Us That Phones Should be Used at a Distance From the Body?

Answer: Yes.
Although most of us are unaware that cell phones emit a type of radiation called radiofrequency (RF), we are even more in the dark that there are fine print instructions in cell phone manuals regarding RF radiation.

These instructions state that the cell phone user should maintain a specified distance between their body and the phone in order to ensure compliance with regulatory safety limits.

Here are some examples:

> "iPhone is evaluated in positions that simulate uses against the head, with no separation, and when worn or carried against the torso of the body, with 5 mm separation…To reduce exposure to RF energy, use a hands-free option, such as the built-in speakerphone, headphones or other similar accessories."
> -Apple iPhone 13

> "Body-worn SAR testing has been carried out at a separation distance of 1.5 cm. To meet RF exposure guidelines during body-worn operation, the device should be positioned at least this distance away from the body."
> -Samsung Galaxy Z Fold 3 5G

> "Body-worn Operation This device was tested for typical use with the back of the device kept 0.39 inches (1.0 cm) from the body. To comply with FCC RF exposure requirements, a minimum separation distance of 0.39 inches (1.0 cm) must be maintained between the user's body and the back of the device."
> -LG G8 page 166

> "Use accessories such as a carrying case, etc., to keep the product at least 1.5 inches away from your body, and make sure there is no metal (part) in between."
> -Docomo Smartphone (Japan) SC-51C(Galaxy S22)

> "This device has also been tested and meets the FCC RF exposure guidelines for use with an accessory that contains no metal and positions the handset a minimum of 15mm from the body. Position the handset a minimum of 15mm from your body when the device is switched on.
> " - OnePlus 10 Pro 5G

Where can I find this information for my cell phone?

- Apple iPhone: Go to “Settings” and then “General” and then “Legal & Regulatory” and then “RF Exposure”
- Samsung has a website on RF instructions here.
- Motorola has a website on RF instructions here.
- LG has a website on RF instructions here.
- Docomo Products (Japan) has a website which links to RF information here

Where can I find this information for my Wi-Fi or wireless device?

- For Apple products like the iPad, iMac, iPod and Apple Watch to Go to Apple's RF section and search your device here.
- For Google Products go to their Safety and Regulatory Information Page here.
- For Amazon Echo Products go to their Safety and Compliance information page here.
- In addition to the phones, these company have a SARs for Samsung products, Motorola products, LG products, Docomo Products

For other products simply search for the manual online or search for the make and model with the additional phrase “RF exposure” and you can access the instructions. Be aware that many manuals will omit this information and it will be located on a separate “safety and legal compliance manual” or online in a less than obvious place.

Did you know that baby monitors, Wi-Fi printers, Apple computers and even Wi-Fi printers have fine print warnings?

Here are some examples:

> “…it is advised to use the Products in such a manner that minimizes the potential for human contact during normal operation.” “This Device should be installed and operated with at least 20 cm between the radiator and your body.”
> -Amazon Echo Dot (4th Generation) Kids Edition Safety and Compliance
>
> This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.”
> –Samsung Smart TV 6200 User Manual
>
> “This device should be installed and operated with a minimum distance of 20 cm between the radiator and your body.”
> –Amazon Echo

This device should be operated with a minimum separation distance of 20 cm (8 inches) between the equipment and a person's body."
–Apple iMac Regulatory Compliance Info OS Monterery 12

"When placing the Apple Watch near your face, keep at least 10 mm of separation to ensure exposure levels remain at or below the as-tested levels."
–Apple Watch Model A1553

"To be sure that human exposure to RF energy does not exceed the FCC, IC, and European Union guidelines, always follow these instructions...Orient the device in portrait mode with the Home button at the bottom of the display, or in landscape mode with the cellular antenna away from your body or other objects."
-Apple iPad IOS4 Important Product Information Guide

"This equipment should be installed and operated with at least 20 cm (8 inches) or more between the radiator and the person's body." -Playstation 4 Pro

"This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the
radiator and your body."
-OC1A Owlet Baby Camera User Manual

Read more fine print warnings here.

Do Any Medical Organizations Share This information?
Answer: YES

The California Department of Health released an advisory on how to reduce cell phone radiation stating, "Carry your cell phone in a backpack, briefcase, or purse; NOT in a pocket, bra or belt holster."

The American Academy of Pediatrics and the North Carolina Public Health Department both state:

> "Avoid carrying your phone against the body like in a pocket, sock, or bra. Cell phone manufacturers cannot guarantee that the amount of radiation you are absorbing will be at a safe level."

The American Academy of Pediatrics wrote the FCC stating that FCC limits do not 1. account for children's unique vulnerability, 2. reflect current use patterns and 3. do not provide consumers with sufficient information about the RF exposure.

> “Pregnant women may carry their phones for many hours per day in a pocket that keeps the phone close to their uterus. Children born today will experience a longer period of exposure to radio-frequency fields from cellular phone use than will adults, because they start using cellular phones at earlier ages and will have longer lifetime exposures. FCC regulations should reflect how people are using their phones today.”

Read more medical recommendations here.

Do Cell Phones Violate Safety Limits In Body Contact Positions?

Answer: YES.
When cellphones are tested in body contact positions, the way most people use phones today, they can emit levels of radiation that violate the government regulatory limits. Published research estimates the radiation levels that can be absorbed into the body can exceed FCC’s radiation exposure limits over 11 times.

See Gandhi, O. P. (2019). Microwave Emissions From Cell Phones Exceed Safety Limits in Europe and the US When Touching the Body. *IEEE Access*, *7*, 47050–47052.

Don't government rules make sure phones are tested in body contact positions, the way we use cell phones?

Answer: NO
In the US manufacturers are not obliged to RF test in body contact positions, despite the fact that people use and carry cell phones in their pants pocket, bra or tucked into spandex pants. Children sit in grocery carts streaming videos on cell phones pressed against their abdomen. Teenagers sleep with cell phones resting on their chest. However, phones in the USA are allowed to be body SAR tested with a separation distance that can go up to 25 mm.

The U.S. FCC is opposed to testing phones in body contact position and states, “Even though some parties claim that the RF exposure evaluation procedures for phones should require testing with a “zero” spacing – against the body – this is unnecessary.”

If we hold a cell phone at the distance stated in the manual will I be safe?
Answer: No.

US FCC government safety limits for human exposure are over 25 years old. They do not protect against the numerous adverse effects scientific research has found links to (brain damage, sperm damage etc.) nor do they address cumulative effects from long term exposures.

The safety limits are based on the assumption that heating is the only harm from non ionizing wireless radiation but this has been well proved wrong by hundreds of peer reviewed and published studies.

A study in *Environmental Health* analyzed the findings of tumor and heart damage from the National Toxicology Program study and concluded that FCC limits should be strengthened by 200 to 400 times to protect children according to current risk assessment guidelines (Uche 2021).

Here are some studies to read:

Belpomme, D., Hardell, L., Belyaev, I., Burgio, E., & Carpenter, D. O. (2018). Thermal and non-thermal health effects of low intensity non-ionizing radiation: An international perspective. Environmental Pollution, 242, 643–658.

International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF), (2022). Scientific evidence invalidates health assumptions underlying the FCC and ICNIRP exposure limit determinations for radiofrequency radiation: implications for 5G. Environ Health. Oct 18;21(1):92.

Miller, A. B., Morgan, L. L., Udasin, I., & Davis, D. L. (2018). Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102). Environmental Research, 167, 673–683.

Where is the science showing this could be harmful?

Research has found memory damage, headaches, oxidative stress and impacts to the brain, endocrine system and reproduction as well as brain, thyroid and breast cancer.

Published case reports document young women developing unusual breast cancers located directly underneath the antennas of where their phones were stored, directly where they placed their cell phones in their bra. A 2020 case control study found that women who used phones close to their bodies had up to five times more breast cancer. A systematic review and meta-analysis of case-control studies found evidence that linked cellular phone use to increased tumor risk (See Choi et al., 2020).

Be aware that as long as the phone is on, it is sending and receiving microwave RF radiation thousands of times an hour, even when you are not talking or using the phone.

Numerous scientists, including senior advisors to the World Health Organization, have concluded that if cell phone radiation were evaluated at this time, it would be considered a probable, if not fully confirmed human carcinogen. See Carlberg and Hardell, 2017; Directorate-General for Parliamentary Research Services (European Parliament) & Belpoggi, 2021; Miller et al., 2018; Melnick, 2019; Portier, 2021.

Read more science here.

But thought non ionizing radiation was safe, because it is not the same as X rays. It's safe because it is non-ionizing. Right?

Answer: False.
Just because it is non ionizing radiation, does not mean it cannot cause harm. That is outdated and well proven wrong information

Read "Scientific evidence invalidates health assumptions underlying the FCC and ICNIRP exposure limit determinations for radiofrequency radiation: implications for 5G" published in Environmental Health by authors including former NIH scientist Ron Melnick that says,

> "In this paper, we show how the past 25 years of extensive research on RFR demonstrates that the assumptions underlying the FCC's and ICNIRP's exposure limits are invalid and continue to present a public health harm. Adverse effects observed at exposures below the assumed threshold SAR include non-thermal induction of reactive oxygen species, DNA damage, cardiomyopathy, carcinogenicity, sperm damage, and neurological effects, including electromagnetic hypersensitivity. Also, multiple human studies have found statistically significant associations between RFR exposure and increased brain and thyroid cancer risk."

As another example, the literature review "Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation" found that in **93 of the 100 peer-reviewed studies** dealing with oxidative effects of low-intensity RFR, researchers found RF induced oxidative effects in biological systems.

"Given the human, animal and experimental evidence, I assert that, to a reasonable degree of scientific certainty, the probability that RF exposure causes gliomas and neuromas is high."

Christopher Portier PhD
Former Director of the National Center for Environmental Health at the Centres for Disease Control and Prevention in Atlanta and the Director of the Agency for Toxic Substances and Disease Registry. Prior to CDC, Dr. Portier was with the National Institute of Environmental Health Sciences for 32 years where he served as the NIEHS Associate Director, Director of the Environmental Toxicology Program, and Associate Director of the National Toxicology Program, and Senior Scientific Advisor to the Director.

Dr. Portier's Report on cell phone radiation with 443 scientific references.

What are other countries doing?

Starting in 2012, the French Government's National Frequency Agency ANFR began testing hundreds of phones in body contact positions, with 0 mm between the phone and body phantom. After pressure from Dr. Marc Arazi from the Phonegate Association, the data is now posted online and it showed that the majority of cell phones exceeded EU regulations. In 2016, the European Union laws were strengthened and they must use a separation distance no higher than 5 mm.

French Ministers later issued a press release recommending that the regulation be further strengthened to 0 mm, but the EU regulations have not yet been changed at this time.

France: A 2019 Ministerial order stated consumers should be informed to use a hands-free or speakerphone, limit frequency and duration of calls for children, keep away from the belly of pregnant women, Keep away from the lower abdomen of adolescents."

Belgium: In 2013 the government banned the sale of phones designed for young children.

Cyprus: Multimedia campaign with full scale bus ads, brochures and videos for teens and parents.

French Polynesia: Multimedia campaign to reduce exposure- video, posters and brochure promoted on television, radio, and social networking platforms translated into Tahitian and French.

Republic of Korea: "Children are advised to avoid using cell phones whenever possible." - Gov Webpage

Table: Policies To Reduce Wi-Fi Exposures in Schools	
Recommendations by public health authorities to prefer wired over Wi-Fi in kindergartens and/or schools	**France, Israel, Germany, French Polynesia, Russia, Maryland State Children's Environmental Health and Protection Advisory Council.**
Wi-Fi banned in daycares and kindergarten	**France, Israel, Ghent Belgium, French Polynesia, Cyprus**
Wi-Fi off or minimized in elementary	**France, Israel, Cyprus**

See more country actions here.

But I thought The FDA, WHO and EPA say this is safe.
Answer: No
None of these entities have ever reviewed **all** the up to date research. Yes, it may seem that way. But no.
If you think so just try and find the scientific report by these agencies that looked at everything from thyroid cancer, to brain impacts to sperm damage. It simply does not exist.

Federal regulatory agencies with health and safety expertise have NOT evaluated the totality of up to date science to make a safety determination.

The WHO International Agency for Research on Cancer (WHO/IARC) in fact designated wireless radiation as a class 2B "possible" carcinogen in 2011 largely based on human studies that found long term cell phone users had increased risk for tumors- glioblastomas and acoustic neuromas (Read the WHO/ IARC 2011 press release). The scientific documentation for the determination was compiled in a 2013 monograph (IARC 2013). Furthermore, because that determination was a decade ago, the WHO/IARC advisory group now has recommended wireless be re-evaluated as a "high priority" within 5 years due, largely in part, to the recent animal research (Falconi, 2018; NTP, 2018) which found evidence for cancer (IARC, 2019).

Several of the scientists who were invited experts to the WHO IARC EMF Working Group have more recently published or issued reports that say that the evidence associating RF with cancer has increased and it should be considered a probable or proven carcinogen.

Here are examples of WHO International Agency for Research on Cancer experts making statements about cell phone and wireless safety

Dr. Lennart Hardell

"We conclude that there is clear evidence that RF radiation is a human carcinogen, causing glioma and vestibular schwannoma (acoustic neuroma). There is some evidence of an increased risk of developing thyroid cancer, and clear evidence that RF radiation is a multi-site carcinogen. Based on the Preamble to the IARC Monographs, RF radiation should be classified as carcinogenic to humans, Group 1."

-Dr. Lennart Hardell in "Comments on the US National Toxicology Program technical reports on toxicology and carcinogenesis study in rats exposed to whole-body radiofrequency radiation at 900 MHz and in mice exposed to whole-body radiofrequency radiation at 1,900 MHz" published in the International Journal of Oncology

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Dr. Portier's Report with 443 scientific references.

Dariusz Leszczynski PhD
"In my opinion, the currently available scientific evidence is sufficient to upgrade the carcinogenicity of cell phone radiation from the possible carcinogen (Group 2B) to the probable carcinogen (Group 2A)"

"Precautionary Principle should be implemented as broadly as possible and feasible…Whenever possible and feasible, wired connections should be promoted over wireless."
-Dariusz Leszczynski PhD in his 2015 lecture.

Igor Belyaev PhD
"The NTP findings along with recent replicated animal studies from Germany [47], supplemented other studies and provided sufficient evidence for carcinogenicity of mobile phone exposure in animals. Studies with chronic exposures have also provided evidence for possible mechanisms of MW effects, which involve production of reactive oxygen/nitrogene species. Taking into account the evidence from human epidemiological studies, MW exposure from mobile phones was suggested to be classified as human carcinogen according to the generally accepted Bradford Hill criteria."

Igor Belyaev, PhD, is the Head Research Scientist at the Cancer Research Institute at the Slovak Academy of Science in Bratislava, Slovakia and has published numerous studies on the non thermal effects of RFR. The quote is from Main Regularities and Health Risks from Exposure to Non-Thermal Microwaves of Mobile Communication

Ronald Melnick PhD

"The NTP studies show that the assumption that RF radiation is incapable of causing cancer or other adverse health effects other than by tissue heating is wrong."

Ronald Melnick PhD in "Regarding ICNIRP'S Evaluation of the National Toxicology Program's Carcinogenicity Studies on Radiofrequency Electromagnetic Fields" published in Health Physics

Ronald Melnick PhD served as a toxicologist for 28+ years at the National Institute of Environmental Health Sciences (NIEHS) and the National Toxicology Program (NTP), before retiring in 2009. At NTP/NIEHS, Dr. Melnick was involved in the design, monitoring and interpretation of toxicology and carcinogenesis studies of numerous environmental and occupational agents including 1,3-butadiene, chloroprene, isoprene, water disinfection byproducts, etc. He led the design of the NTP carcinogenicity studies of cell phone radiofrequency radiation in rodents.

James C. Lin PhD

"there are consistent indications from epidemiological studies and animal investigations that RF exposure is, at least, probably carcinogenic to humans. The principle of ALARA—as low as reasonably achievable—ought to be adopted as a strategy for RF health and safety protection." James C. Lin in Carcinogenesis from chronic exposure to radio-frequency radiation.

"The time is right for the IARC to upgrade its previous epidemiology based classification of RF exposure to higher levels in terms of the carcinogenicity of RF radiation for humans. Recently, two relatively well-conducted RF and microwave exposure studies employing the Sprague–Dawley strain of rats—without, however, using any cancer-promoting agents (or co carcinogens)—showed consistent results in significantly increased total primary cancer or overall tumor rates in animals exposed to RF radiation."

James C. Lin PhD in The Significance of Primary Tumors in the NTP Study of Chronic Rat Exposure to Cell Phone Radiation published in IEEE Microwave Magazine

James C. Lin PhD long served as Editor in Chief of Bioelectromagnetics and has numerous publications on RFR and electromagnetic radiation. He has served in numerous leadership capacities including the President's Committee on the National Medal of Science. He was awarded the d'Arsonval Medal Award of the Bioelectromagnetics Society in 2003.

More

- **February 2020-** Scientists of the National Institute of Environmental Health Sciences National Toxicology Program published a study finding "significant increases in DNA damage" in groups of male mice, female mice and male rats after just 14 to 19 weeks of exposure to RFR (Smith-Roe et al., 2020).
- **March 2020**- Yale researchers published a study supported by the American Cancer Society linking thyroid cancer to cell phone use in people with a type of common genetic variation (Luo et al., 2020).

- **May 2020-** A meta analysis of 300 peer-reviewed scientific publications (1990-2015) describing 1127 experimental observations in cell-based in vitro models on RFR published in *Environmental Research* found less differentiated cells such as epithelium and spermatozoa are more sensitive to RF (Halgamuge et al., 2020).
- **May 2020**- A review on real world exposure to 5G published in *Toxicology Letters* found that 5 G will have systemic effects as well as adverse effects to the skin and eyes (Kostoff et al., 2020).
- **November 2020-** A systematic review and meta-analysis of case-control studies found evidence that linked cellular phone use to increased tumor risk (Choi et al., 2020).
- **February 2021**- A 4G study found kidney inflammation and damage to the testes in mice (Hasan et al., 2021).
- **March 2021**- The Switzerland Institute of the Environment expert published review found increased oxidative stress in the majority of animal studies and cell studies with exposures within regulatory limits (Schuermann et al., 2021).
- **July 2021-** International consensus report calls for the acknowledgement of electrohypersensitivity as a distinct neuropathological disorder and for inclusion in WHO Int. Classification of Diseases (Belpomme et al. 2021).
- **July/August/November 2021**- Research (Hassanzadeh- Taheri et al.,2022) and systematic reviews find harm to sperm (Yu et al., 2021, Kim et al., 2021, Negi and Singh 2021)
- **August 2021**- A review on impacts to the thyroid found RFR might be associated alterations in thyroid hormone levels, with a possible disruption in the hypothalamic-pituitary-thyroid axis (Alkayyali et al., 2021)
- **August 2021-** 2400 MHz affects the structural integrity of the hippocampus in mice (Hasan et al., 2021).
- **August 2021-** A review summarizes the effects of EMR on the neurotransmitters in the brain (Hu et al., 2021).
- **August 2021-** Review on RFR and the brain published in the International Journal of Radiation Biology found the threshold for an effect in EEG is far lower than the level deemed safe by the U.S. FCC (Hinrikus et al. 2021).
- **September 2021**- A systematic review on the effects of RFR to male reproductive hormones found that wireless can decrease testosterone (Maluin et al. 2021).
- **September 2021-** A review on the genetic effects of non-ionizing electromagnetic fields found DNA strand breaks, micronucleus formation, and chromosomal structural changes (Lai 2021).
- **September 2021**- A systematic review published in the Annals of the New York Academy of Sciences found that neuronal ion channels are particularly affected (Bertagna et al 2021).
- **October 2021**- A review in the International Journal of Oncology describes how EMFs lead to dysfunction of ion channels which lead to reactive oxygen species/free radical overproduction providing " a complete picture" of how exposure may indeed lead to DNA damage and related pathologies, including cancer," (Panagopoulos et al. 2021).
- **October 2021-** Scientific modeling study finds RF absorption in a mosquito is 16x higher at 60 GHz than at 6 GHz indicating 5G future technologies "can cause dielectric heating and have an impact on behaviour, development and possibly spread of the insect" substantiating calls to ensure pollinators are protected before 5G deployment.

"Cellphones (handsets) are not normally designed to be used or operated in extremity only exposure conditions. The maximum output power levels of cellphones, in conjunction with the required head and body SAR test results, generally do not require extremity SAR testing to show compliance."

iPhone11
https://fccid.io/BCG-E3309A/Test-Setup-Photos/SAR-Setup-Photos-4398113
User guide https://fccid.io/BCG-E3309A/Users-Manual/UserGuide-Part1-4397878

The FCC Withheld Critical Information Regarding Its Cell Phone SAR Tests

The FCC apparently failed to disclose that its own cell phone tests found that the FCC SAR tested cell phones and found that cell phones can exceed FCC's human exposure limits when tested in use positions close to the body. On September 29, 2023, Theodora Scarato received 11 documents of the 18 the FCC has identified as responsive to her FOIA requesting records related to any cell phone RF tests the FCC had conducted on cell phones on the US market January 2017 through April 2020.

The documents revealed that the FCC had measured the SARs of Apple, Motorola, Samsung and Blu cell phone models and found most phone models they tested had exceeded local SAR levels when tested at 2 mm from the body. In addition to the FCC 2mm tests, the FOIA documents also included documents related to the recall of the DDM Brand cell phone model, the Andy 5.5M LTE VR, on February 16, 2016 due to RF limit violations found in post-market surveillance tests. Because seven records were withheld from Scarato's request, EHT filed a FOIA Appeal on December 28, 2024 for the remaining documents.

The FCC's Secret Chicago Tribune cell phone 2mm RF tests

The FCC was prompted to conduct RF exposure tests in response to a Chicago Tribune investigation[1] which had tested several cell phone models in several positions and found violations of the FCC limit. The exceedances were especially high when the phones were tested at 2 mm from the body, such as when people keep phones in a pants pocket.

[1] Chicago Tribune "We tested popular cellphones for radiofrequency radiation; Now the FCC is investigating"

In August and September of 2019, the FCC tested the same phone models the Chicago Tribune had tested in the same two positions the Tribune had:

- With the manufacturers cell phone/body separation test distance (from 5mm to 15 mm depending on the model)
- With a 2 mm phone/body separation

The FCC then released a report on December 10, 2019 ostensibly summarizing the results of the FCC's cell phone radiation SAR tests. However, the FCC **only publicly shared the SAR test levels from the tests they did with the manufacturers' test separation distance of 5 to 15 mm. These levels were found to be c**ompliant with FCCs cell phone SAR limit. The FCC omitted the 2mm test findings that exceeded RF limits. The FCC's 2019 report concluded that:

> CONCLUSION All sample cell phones tested by the FCC Laboratory…comply with the FCC RF radiation exposure for ? general population/uncontrolled limits…

However the FCC's 2019 2mm test found RF levels in some models exceeded FCC RF limits by up to 300%. The 2023 FOIA letter from the FCC to Theodora Scarato [2] states:

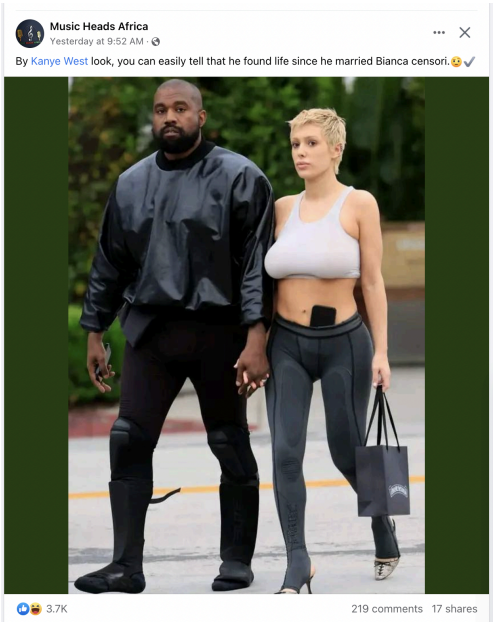
> We observed that at a 2 mm separation distance, the FCC RF exposure limits were exceeded…

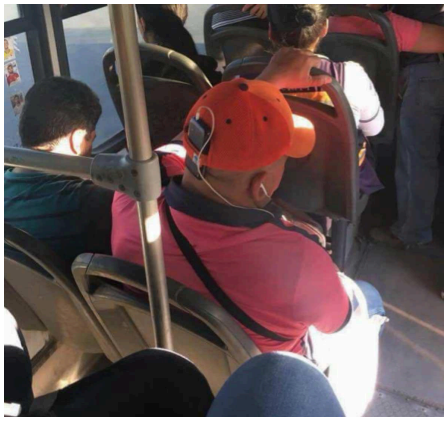
The FCC's 2mm cell phones RF measurement data was on a spreadsheet that stated at the top in bold red letters "*CONFIDENTIAL* *FCC INTERNAL ONLY* *NOTE: THE FOLLOWING RESULTS ARE FROM SAR TESTS AT A SEPARATION DISTANCE NOT IN ACCORDANCE WITH FCC GUIDANCE." The FCC's 2023 FOIA letter seems to attempts to explain why it did not take enforcement action on the violations by stating:

> …we release our 2 mm separation distance test results with the caveat that the 2 mm separation distance test results are inconsistent with FCC practice, and are misleading because they reflect extreme conditions.

The FCC's inaccurately refers to the 2mm tests as reflecting "extreme conditions" despite todays reality that cell phones are commonly used at 2 to 0 mm from the bodies of people of all ages, including infants, toddlers, children, teenagers and adults.

[2] 2023 letter from the FCC to Theodora Scarato RE FOIA Control Nos. 2023-000281 and 2023-000325


Music Heads Africa
Yesterday at 9:52 AM ·
By Kanye West look, you can easily tell that he found life since he married Bianca censori.
3.7K
219 comments 17 shares



Furthermore, a California Department of Health 2019 publication[3] entitled Real-world cell phone radiofrequency electromagnetic field exposures found phones can increase RF emissions to their highest power (10,000 higher) under certain real- world conditions.he Thus, FCC's test methods should always test phones with current usage positions at their highest power.

The FCC further defends its decision not to take enforcement action on the RF violations it documented by stating in its 2023 letter to Scarato that," given that the RF exposure limit includes a significant safety margin, none of the results suggest there is any RF safety issue with the devices tested."

[3] Wall, S., Wang, Z.-M., Kendig, T., Dobraca, D., & Lipsett, M. (2019). Real-world cell phone radiofrequency electromagnetic field exposures. *Environmental Research*, *171*, 581–592.

However, the FCC has not clarified *at what SAR level* the FCC will take an enforcement action, nor what the FCC considers actual safety margin to be. As detailed throughout this brief, the "safety margin" is based on a threshold of only adverse heating effects, not non-thermal biological impacts. However, even with regard to heating impacts, the safety factor for cell phone RF compliance limits remains unclear. The FCC uses the term but does not provide a specific number.

In addition, the FCC is inconsistent about what SAR levels in excess of the RF limit of 1.6 W/kg will trigger enforcement action. The FCC forced the Andy 5.5M LTE VR, to be recalled on February 16, 2016 due to RF limit violations of 170% the limit, yet did not take action on the Chicago Tribune models which also exceeded the limit. The FOIA documents show the measurements that triggered the Andy 5.5M LTE VR recall was 2.64 W/kg and 2.83 W/kg. The FCC cell phone RF limit is 1.6 W/kg.

The FOIA documents state the FCC was poised to take enforcement action for the Andy phone if the RF exceedances were not addressed. On February 2, 2017, Kaveh Moraghebi of Bay Area Compliance Laboratories stated that:

> Per FCC regulation for this type of issue, this result was reported to the FCC directly, and they responded with the following: "Please inform them that if they do not provide, in a few days, a corrective action and confirm that they have stopped selling non-compliant units, Enforcement action by the FCC will need to be taken. They need respond as soon as possible.

However, in contrast to the ANDY phone, the Chicago Tribune cell phones had much higher measured SARs in several of the models **yet the FCC did not act to ensure corrective action.** The FCC 2 mm tests measured the Apple's iPhone XS SAR at 2.340 and 1.990 W/kg; Samsung's Galaxy S9 SAR at 4.520 and 4.380 W/kg; Samsung's Galaxy J3 SAR at 5.200 and 5.140 W/kg; Motorola's Moto g6 at 1.980 W/kg and; BLU's Vivo 5 Mini SAR at 2.200 and 2.750 SAR. These models violated the FCC SAR limit of 1.6 W/kg when the FCC tested the phones when used close to the body. Om Gandhi's published research[4] indicates that had the phones been tested at 0 separation, the measured SAR would have been even higher(?).

Therefore, , the 2mm test results demonstrate that the FCC had data in December 2019 showing phones can test as compliant with the FCCs limits when the tests use a larger separation distance yet those same phones can violate RF limits when tested closer to the body.

This data is pertinent to the issue of whether the FCC's RF compliance test procedures from 1996 are relevant today. The FCCs 2013 Inquiry sought "comment on the feasibility of evaluating portable RF sources without a separation distance when worn on the body to ensure compliance with our limits under present-day usage conditions." In 1996, when the FCC regulations were established, people placed phones in holsters on their belt separating the

[4] Gandhi, O. P. (2019). Microwave Emissions From Cell Phones Exceed Safety Limits in Europe and the US When Touching the Body. *IEEE Access, 7*, 47050–47052.

phone from the body. Phones were not typically carried in pockets. Usage patterns have changed over the last 28 years.

Despite these findings and acknowledgement of changed usage patterns, the FCC omitted the 2 mm cell phone RF test results from the open rulemaking, the FCCs resolution of inquiry[5] and from the FCC's court brief[6] in EHT et al v the FCC. Thus, **the FCC has not been fully candid with the public or the court..**

All links included by reference

[5] December 4, 2019 RESOLUTION OF NOTICE OF INQUIRY
[6] FCC Reply Brief 9/22/2020